

# K50-94

ALUMINUM ELECTROLYTIC CAPACITOR

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AZHAR.673541.022 TU



Polar, sealed, isolated/non-isolated, snap-in radial capacitors. The capacitor type is produced for the internal wiring with the requirements to 98% air humidity at  $T=35^{\circ}\text{C}$  and  $T=25^{\circ}\text{C}$ .

## MAIN PARAMETERS

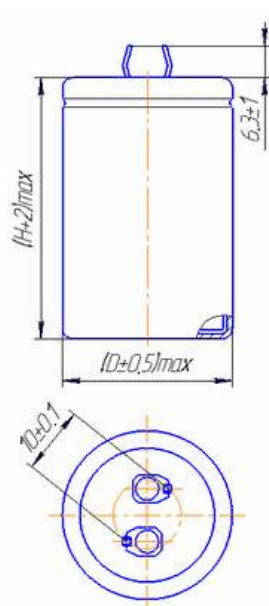
Name	Value
Rated voltage, V	160...450
Rated capacitance, $\mu\text{F}$	47...2 200
Capacitance tolerance (25°C, 50 Hz), %	+50...-20; $\pm 20$
Temporary overvoltage within 10 sec., V	1.15 $U_R$ ( $U_R=160,200,250$ ) 1.1 $U_R$ ( $U_R=400,450$ )
Maximum operating temperature $T_{env}$ , °C	+125
Minimal operating temperature $T_{env}$ , °C	-60

## CAPACITORS RELIABILITY

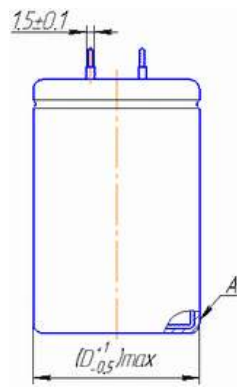
Reliability Operation modes	Minimal nonfailure operating time, $t_{\lambda}$ , hours	Capacitor failure rate, $\lambda$ , 1/hour, max
Maximum-permissible mode ( $U_R$ , $T_{env}=125^{\circ}\text{C}$ )	2 000	$1 \times 10^{-4}$
Maximum-permissible mode ( $U_R$ , $T_{env}=100^{\circ}\text{C}$ )	6 200	$5 \times 10^{-5}$
Typical operating mode ( $0.7U_R$ , $T_{env}=85^{\circ}\text{C}$ )	30 000	$5 \times 10^{-4}$
Typical operating mode ( $0.7U_R$ , $T_{env}=55^{\circ}\text{C}$ )	250 000	$5 \times 10^{-5}$
Storageability Gamma-rated time of capacitor storageability $T_{cy}$ at $y=95\%$ , years, min	25	

## CAPASITOR PHYSICAL CONFIGURATION

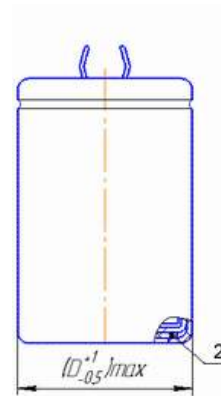
Temperate/cold climate version (Nonisolated)



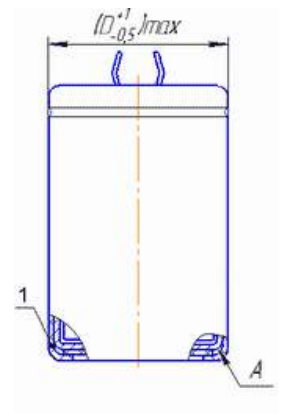
All climate version (Nonisolated)



Temperate/cold climate version (Isolated)



All climate version (Isolated)



A – Enamel coating

1 – Isolation sleeve  
2 – Insulation strip

## CAPACITOR RATINGS

U <sub>R</sub> , V	160	200	250	400	450
C <sub>R</sub> , μF					
47					✓
68				✓	✓
100				✓	✓
150		✓	✓	✓	✓
220	✓	✓	✓	✓	✓
330	✓	✓	✓	✓	✓
470	✓	✓	✓	✓	✓
560	✓	✓	✓	✓	
680	✓	✓	✓		
1 000	✓	✓	✓		
1 500	✓	✓	✓		
2 200	✓	✓			

## CAPACITOR ELECTRIC PARAMETERS VALUE WHEN DELIVERED

Ur, V	Cr, $\mu$ F	Size DxH, mm	tg $\delta$ , %	I <sub>LEAK</sub>	Z*, Ohm, 25°C	ESR, Ohm, 25°C, 100Hz	I <sub>R</sub> , mA, 125°C, 50 Hz	Mass, g
160	220	22x25	15	750	0.900	1.00	0.64	30
160	330	22x30	15	919	0.580	0.60	0.88	35
160	470	25x30	15	1 097	0.490	0.50	1.20	45
160	560	25x35	15	1 197	0.380	0.40	1.27	50
160	680	25x40	25	1 320	0.290	0.30	1.52	55
160	1 000	30x35	25	1 920	0.190	0.20	2.00	70
160	1 500	35x40	25	2 800	0.158	0.16	2.25	100
160	2 200	35x50	25	4 200	0.119	0.12	3.20	120
200	150	22x25	15	693	1.400	1.50	0.56	30
200	220	22x30	15	839	1.180	1.20	0.80	35
200	330	25x30	15	1 028	0.900	1.00	1.04	45
200	470	22x35	15	1 226	1.500	1.60	1.12	40
200	470	25x30	15	1 226	0.800	0.90	1.20	45
200	470	25x40	15	1 226	0.750	0.80	1.44	55
200	560	30x30	25	1 340	0.580	0.60	1.52	60
200	680	35x30	25	1 620	0.580	0.60	1.68	80
200	1 000	35x35	25	2 400	0.480	0.50	1.92	90
200	1 500	35x40	25	3 600	0.280	0.30	2.72	100
200	2 200	35x50	25	5 200	0.180	0.20	3.36	120
250	150	22x25	15	775	1.400	1.50	0.56	30
250	220	22x30	15	938	1.180	1.20	0.80	35
250	330	25x30	15	1 149	0.900	1.00	1.04	45
250	470	30x30	20	1 400	0.750	0.80	1.52	60
250	560	30x35	20	1 800	0.580	0.60	1.60	70
250	680	30x40	20	2 000	0.480	0.50	1.84	80
250	1 000	30x40	20	3 000	0.580	0.60	2.00	80
250	1 000	35x40	20	4 200	0.380	0.40	2.24	100
250	1 500	35x50	20	4 600	0.290	0.30	2.80	120
400	68	22x30	15	660	2.180	2.20	0.64	35
400	100	22x30	15	800	1.600	1.80	0.72	35
400	150	22x40	15	980	1.400	1.50	0.88	45
400	220	25x40	15	1 187	1.180	1.20	1.04	55
400	330	30x40	20	3 000	0.900	1.00	1.36	80
400	470	35x40	20	3600	0.750	0.80	1.84	100

Ur, V	Cr, $\mu$ F	Size DxH, mm	tg $\delta$ , %	I <sub>LEAK</sub>	Z*, Ohm, 25°C	ESR, Ohm, 25°C, 100Hz	I <sub>R</sub> , mA, 125°C, 50 Hz	Mass, g
400	560	35x50	20	3 800	0.580	0.60	2.24	120
450	47	22x30	15	552	2.450	2.50	0.56	35
450	68	22x30	15	700	2.180	2.20	0.64	35
450	100	22x40	15	849	1.600	1.80	0.80	45
450	150	25x40	15	1 039	1.400	1.50	0.96	55
450	220	30x40	15	1 259	1.180	1.20	1.20	80
450	330	35x40	20	3 000	0.900	1.00	1.60	100
450	470	35x50	20	3 600	0.750	0.80	2.00	120

\* Capacitor impedance Z is measured at frequency 100 kHz for capacitors C<sub>R</sub> ≤ 1 000  $\mu$ F, and at frequency 10 kHz for capacitors C<sub>R</sub> > 1 000  $\mu$ F

## CAPACITORS OVERALL DIMENSIONS AND MASS

Ur, V	160	200	250	400	450
Cr, $\mu$ F	DxH, mm mass, g				
47					<u>22x30</u> 35
68				<u>22x30</u> 35	<u>22x30</u> 35
100				<u>22x30</u> 35	<u>22x40</u> 45
150		<u>22x25</u> 30	<u>22x25</u> 30	<u>22x40</u> 45	<u>25x40</u> 55
220	<u>22x25</u> 35	<u>22x30</u> 45	<u>22x30</u> 45	<u>25x40</u> 80	<u>30x40</u> 100
330	<u>22x30</u> 45	<u>25x30</u> 45	<u>25x30</u> 45	<u>30x40</u> 80	<u>35x40</u> 100
470	<u>25x30</u> 45	<u>25x40</u> 40 <u>22x35</u> 45 <u>25x30</u> 55	<u>30x30</u> 60	<u>35x40</u> 100	<u>35x50</u> 120
560	<u>25x35</u> 50	<u>30x30</u> 60	<u>30x35</u> 70	<u>35x50</u> 120	
680	<u>25x40</u> 55	<u>35x30</u> 80	<u>30x40</u> 80		
1 000	<u>30x35</u> 70	<u>35x35</u> 90	<u>35x40</u> 80 <u>30x40</u> 100		
1 500	<u>35x40</u> 100	<u>35x40</u> 100	<u>35x50</u> 120		
2 200	<u>35x50</u> 120	<u>35x50</u> 120			

Ripple current effective value

versus temperature and frequency can be found from the formula  $I_{r0} = I_r \times K_T \times K_F$ , where

$I_r$  – allowable ripple current at 85 °C, 50 Hz (See Table “Capacitor electric parameters”)

### **$K_T$ - $I_r$ CORRECTION FACTOR VERSUS TEMPERATURE**

<b><math>T_{env}, ^\circ C</math></b>	<b>25</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>85</b>	<b>100</b>	<b>125</b>
$K_T$	2.1	2.04	1.98	1.9	1.73	1.5	1.0	1.0

### **$K_F$ - $I_r$ CORRECTION FACTOR VERSUS FREQUENCY**

<b>F, Hz</b>	<b>50</b>	<b>100</b>	<b>300</b>	<b>600</b>	<b>1 000</b>	<b>10 000</b>	<b>30 000</b>
$K_F$	1.0	1.25	1.5	1.63	1.69	1.88	2.0

### **EXAMPLE OF REFERENCE DESIGNATION FOR ORDERING**

CAPACITOR K50-94 – 200V – 470 $\mu$ F (+50 -20)% – (25 $\times$ 40) AZHYAR.673541.022 TU

CAPACITOR K50-94 – 200V – 470 $\mu$ F (+50 -20)% – (22 $\times$ 35) – I AZHYAR.673541.022 TU

CAPACITOR K50-94 – 200V – 470 $\mu$ F (+50 -20)% – (25 $\times$ 30) – V AZHYAR.673541.022 TU

CAPACITOR K50-94 – 200V – 470 $\mu$ F  $\pm$ 20% – (25 $\times$ 40) – I – V AZHYAR.673541.022 TU